

POULTRY SCIENCE DEPARTMENT *Newsletter*

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Kiess joins department as assistant professor

Dr. Aaron S. Kiess recently joined the Department of Poultry Science as an assistant professor.

He will teach the undergraduate poultry physiology and anatomy courses. Dr. Kiess plans to focus his research efforts on pre-harvest food safety where he will work with *Campylobacter* and *Salmonella*. He also looks forward to collaborating with other scientists in the department and other universities to address welfare issues that may have potential impact on the poultry industry in Mississippi.

Dr. Kiess is a native of Elkins, W.Va., and attended West Virginia University where he received



his bachelor's, master's and doctorate degrees. While working towards his master's in animal and veterinary science, he explored the interactions of turkey lines and gender with *Campylobacter* and the onset of infection. Dr. Kiess then pursued his doctorate in genetics and developmental biology where he focused on nutrient utilization. More specifically, he investigated ways to improve lysine utilization in poultry by better understanding the mechanisms responsible for lysine degradation. Upon completion of his doctorate, Dr. Kiess accepted a post-doctoral fellowship at Purdue University where he managed an epidemiological study that evaluated the effects of cage design and feeder space on the productivity, body weight and welfare of laying hens.

Please help us welcome Dr. Kiess to Mississippi and the Department of Poultry Science.

Graduate students win awards

Two graduate students from the MSU Department of Poultry Science, Brenna McGruder and Jessica Wells, were awarded Certificates of Excellence for their presentations at the International Poultry Science Forum held by the Southern Poultry Science Society in Atlanta, Ga., on January 21-22, 2008. Brenna's advisor is Dr. David Peebles. Brenna also recently received a research award from the Sigma Xi Scientific Research Society. Jessica is advised by Drs. Chris McDaniel and Craig Coufal. Both students received a \$500 prize along with their certificates.



Brenna McGruder, left, and Jessica Wells.

Congratulations to these two students on their academic accomplishments.



Poultry Research News

Poultry Welfare — What's new?

By Yvonne Vizzier Thaxton, PhD
Professor

In a poultry focused 1927 issue of *National Geographic*, M.S. Jull wrote, “It is a far cry from the time that man first heard the crow of the wild cock of the bamboo jungles of India to the cackle of the highly domesticated hen upon celebrating production of 1,000 or more eggs.” He would be amazed at the performance of today’s birds, both broilers and layers. The extent of evolution within the poultry world during the last 80 years would certainly astound him. In 1927, the poultry industry as we know it did not exist, rather eggs and meat came from backyard flocks maintained behind city homes as well as in the country. The progress within the industry has allowed large numbers of birds to be produced on very few farms. These changes have produced a separation of people from agriculture. In the 1920s most Americans had some contact with agriculture. Today less than 2% of the U.S. population is associated with agriculture. This loss of connection resulted in a loss of knowledge and understanding which generates mistrust of agricultural practices. One aspect is the slaughter of animals for food. The problems of perception have been increased by widespread reporting of abuses by a very few in the agricultural sector. To counter this, it is critical that those of us in agriculture do all that we can to do the “right thing” and that means examining our own practices. To do this, we need to consider each of the criticisms and determine if they are justified using the best information available.

Today, much of the criticism comes from animal rights groups attributing human feelings, mental experiences and reactions to all animals. To respond to specific criticism, animal behaviorists used visible behaviors to measure animal “welfare.” For example, gait scoring, which is a system of evaluating a bird’s walk as a means of evaluating leg condition, or the space available for birds to flap their wings. While many of these measures are valid, they do not necessarily reflect the animal’s level of comfort. To address this problem, researchers with USDA and Mississippi State’s Poultry Science Department examined the effects of specific stressors on both broilers and layers. This work yielded data that allows the evaluation of birds by chemical testing rather than by “appearance.” Corticosterone is the

stress hormone in birds. It can be accurately measured by chemical testing. Thus, it is a way of objectively measuring a bird’s reaction to stress.

The group has completed a project dealing with bird density and found that density alone is not a problem for the birds when other environmental conditions are right. Meanwhile, researchers at the animal care unit of Oxford University in England reported that low light eliminated problems associated with the “pecking order.” This was substantiated by the Mississippi State study. The late J. Paul Thaxton, PhD, coined the phrase “physiological fitness” as a goal rather than just the appearance or behavior. His work showed that the bird’s ability to withstand stressors was more important to their general well-being than the absence of stress. That is, birds reared in environments with little or no stress suffered more when a stress was introduced than birds that had experienced mild stressors during their growing period. In the case of layers, birds grown in cages withstood stress better than those grown in a large, open pens furnished with perches and other enrichments.

From this work it was determined that corticosterone could be used to provide an objective measure of stress from any aspect of the bird’s handling. In addition to the work on the bird’s environment, the group has completed a study that used this chemical to objectively evaluate the stress of hand and machine catching of chickens. This work confirmed that the act of turning the birds upside down is stressful. So, even if the birds are caught by machine in an upright position, they are later hung upside down on shackles prior to stunning. Controlled atmosphere stunning (CAS) or gas stunning addresses this issue by stunning the birds before they are hung on the shackle. However, this method also has its critics as it exposes the workers and environment to potentially dangerous gases, primarily carbon dioxide.

Looking for an alternative to current methods, which while humane when properly done have specific problems, TechnoCatch, LLC in Kosciusko, Miss., asked the MSU research team to work with them in developing a new system. This system uses low atmospheric pressure (LAPS) to stun the birds before they are hung on the line without the use of gases. Extensive testing at MSU and USDA paved the way for development of the commercial prototype. Once built, the prototype was tested

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Litter - the new buzz word in farming

By Craig Coufal, PhD
Assistant Extension Professor

Farmers of all types have long understood that chicken litter is an excellent organic fertilizer. Since litter does not contain plant nutrients at the concentrations found in most inorganic fertilizers, the cost of moving litter from chicken farms to other farms has been an economic obstacle. High fuel prices in recent years have made hauling litter more than a few miles even less economical. However, recent rapidly climbing commercial fertilizer prices have sparked the interests of farmers to use more litter to save money on fertilizer costs, so much that the demand is greater than the supply. Even with high fuel prices, thus making transportation expensive, litter is still a good value for farmers. This situation gives chicken growers a prime opportunity to sell their litter.

Two programs are available to help both the chicken grower selling the litter and the farmer buying the litter. The first is the Poultry Litter Clearinghouse established by the Mississippi Farm Bureau (MSFB). This webpage is designed to help buyers and sellers find each other by

listing an advertisement to either buy or sell litter. The web address is www.msfb.com/PCH.aspx or contact Andy Whittington at MSFB to register your advertisement.

Secondly, the Natural Resources Conservation Service (NRCS) has a program which can help make moving litter longer distances to farmers more economical. Through the Environmental Quality Incentives Program (EQIP), landowners who receive litter for application to crop or pastureland can receive “incentive payments” to defray the costs of transportation. The program is designed to encourage the movement of litter from areas of high poultry production to areas with little or no poultry production and land application of litter. Payments are based on the distance litter is transported, paying up to \$18 per ton for litter moved more than 125 miles from the source farm. EQIP requires the participant to enter into a three year contract for the manure incentives. EQIP payments are to be used for transportation costs only and do not cover the cost of purchasing litter. For more information on EQIP poultry litter transfer incentives, farmers should contact their local USDA/NRCS field office.

Poultry Welfare

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at both the MSU poultry research farm and at a commercial broiler facility. These tests included blood gases, meat quality, corticosterone level and even heart (EKG) and brain (EEG) function. Observation of birds in the chamber helped refine the operating parameters which allowed production of a commercial unit. Corticosterone levels indicate that this method is substantially less stressful than the conventional water bath stunning, very likely as the birds are not hung while still conscious. The system is fully automated so that the potential for error is virtually eliminated, making it a viable option for use in poultry slaughter so that birds can be processed without turning them upside down and thus eliminating another stressor from the system. USDA’s New Technology Branch along with FSIS, MPI inspectors allowed testing of this commercial unit at a broiler processing plant. There were no problems processing or inspecting these birds. So, the stage is set for final testing which will lead to the offering of the system for sale in the relatively near future.



Graduate student participates in International Poultry Science Forum

Derrick L. Everett, MSU poultry science graduate student, presented a poster entitled “Dietary evaluation of Primalac and amino acid levels in commercial broilers” at the International Poultry Science Forum in Atlanta, Ga., in January. Dr. Michael Kidd is his advisor.

Poultry Extension News

Calibrating Poultry Litter Spreading Equipment

Proper nutrient management is a vital part of any agricultural enterprise, particularly for those utilizing manure nutrients. Proper utilization of nutrients from animal manures is not only important for preserving soil, water and environmental quality, but has become important for economic reasons as the cost of commercial fertilizers continues to increase. Application of nutrients beyond crop needs not only increases the potential for nutrient loss from fields, it is also an inefficient use of a valuable fertilizer product that could be sold off the farm and generate revenue. Therefore, calibrating litter spreaders (i.e., knowing the rate of litter application under certain conditions) is important to assure proper nutrient management and maximize the economical use of manure nutrients.

Calibration of manure and litter spreaders is typically done using techniques designed for the calibration of commercial fertilizer spreaders. Precision calibration for commercial fertilizer spreaders is very important for obvious economic reasons. However, calibrating litter spreaders can be quite different due to the differences in material density, handling and flow characteristics and particle size, especially when spreading cake-out litter. One of the most commonly recommended methods of litter spreader calibration is referred to as the "tarp method." The procedure outlined below is a "modified" version of the tarp method that works well for poultry litter spreader calibration. Spreader calibration can easily be done by one person in only a few minutes.

Materials needed: Six small plastic tarps of the same size (most common sizes such as 8' x 8', 8' x 10' or 10' x 12' will work), a bucket or other weighing container, a scale and a calculator.



Step 1: Place the six tarps in a row on flat area. Pin the corners and centers of the tarps where they meet with spikes or heavy weights. Do not overlap the tarps.



Step 2: Drive the spreader over the center of the six tarps (where the 3rd and 4th meet). Operate the spreader several yards before and after you drive over the tarps. Operate the spreader as you would in the field, and record gear selection, engine RPMs, spreader gate opening, spreader hydraulic flow control setting, or any other information that could affect the rate of litter application.



Step 3: Assess the spread pattern of litter on the tarps. Estimate the width of the area of heaviest application and the width of lesser application on the edges of the spread pattern. Use this information to estimate the distance needed between spreader passes to achieve a uniform application over all tarps. On subsequent passes, overlap the thin edges of the spread pattern, but do not overlap the areas of heaviest application. Practice trials conducted at Mississippi State University show drastically different spread patterns and rates of application for dry litter from complete clean-out and caked litter removed between flocks. Be sure to calibrate equipment using the type of litter that will be applied. Caked litter spread patterns tend to be much wider and inconsistent than loose, dry litter spread patterns.



Step 4: Make a pass on each side of the first pass at the appropriate distance estimated in Step 3. If done at the correct distance, an even application of litter should be achieved across all areas between the centerline of the 2nd and 3rd passes.



Step 5: Collect the litter deposited on each of the four middle tarps individually. The litter can be poured into a bucket (pictured above), or simply fold the tarp up with the litter inside and place the tarp and litter in the bucket. If this is done, be sure to weigh and record the weight of the bucket and tarp together before spreading the litter on the tarps. The four middle tarps represent what the average application rate would be in the field when overlapping passes are taken into consideration. The outer two tarps are for helping to evaluate spread pattern width, particularly for caked litter, which is often wider than the middle four tarps.

Step 6: Weigh the bucket and litter (or bucket, tarp and litter). Record the empty weight of the bucket before collecting the litter on the tarp. Subtract the weight of the empty bucket (or bucket + tarp) to get the weight of the litter only. Do this for each of the four middle tarps.



Step 7: Calculate the rate of application for each of the four middle tarps. Use the following equation:

$$\frac{(\text{pounds of litter on tarp}) \times 21.78}{\text{area of the tarp (square feet)}} = \text{tons of litter/acre}$$

Example: The bucket and the litter in the picture weighed 9.75 lbs., and the empty bucket weighed 1.75 lbs. Therefore, 8 lbs. of litter multiplied by 21.78, divided by 80 (our tarps were 8' x 10') = 2.18 tons/acre.

Step 8: Repeat the procedure several times to get a reliable average. If the rate of application is higher or lower than the desired rate based on nutrient management planning, then make equipment adjustments (RPMs, hydraulic flow controls, gate opening, etc.) and/or drive the equipment faster or slower.

Cost: The procedure is very inexpensive. The tarps used in the calibration trial cost \$5 each, for a total of \$30. The small dial scale was purchased at the local cooperative for \$35; however, you can use any reliable scale you may already have. Most people have buckets around the farm, and most people already own a simple handheld calculator. Most cell phones also have built-in calculators. Therefore, total costs should be less than \$70, and the tarps and scale can be re-used over and over to do future calibrations if equipment, litter type or desired rate of application changes.

Written by Craig Coufal, PhD, Assistant Extension Professor.

Poultry Youth Programs



The Mississippi FFA State Poultry Judging Contest was held at the Hill Poultry Science Building on April 11. FFA students competed for top honors in many classes including live bird evaluation, egg grading and broiler carcass grading (pictured above, left to right). The top three senior division teams were Sumrall, 1st; Carthage, 2nd; and Jasper County, 3rd. The top three junior teams were Mize, 1st; Pine Grove, 2nd; and Jasper County, 3rd. The top senior team, Sumrall, will represent the Mississippi FFA at the National FFA Poultry Judging Contest.

Scheduled Youth Events

4-H Club Congress - May 29, 2008 at Mississippi State University

- Egg Preparation and Demonstration Contest
- Poultry Judging Contest

Project Achievement Days

- Southeast District - June 10, 2008 at Forrest County Middle School in Hattiesburg
- Southwest District - June 11, 2008 at Co-Lin Community College in Wesson
- Northwest District - June 12, 2008 at Mississippi Delta Community College in Moorhead
- Northeast District - June 13, 2008 at Itawamba Community College in Fulton

Poultry BBQ Contests

- North State - June 24, 2008 in Winona
- South State - June 25, 2008 in Gallman



Upcoming Events

- The Mississippi Poultry Management School, sponsored by the Mississippi Poultry Association (MPA), will be held in Jackson on May 13-14, 2008. Contact the MPA for more information and registration details. Call (601) 355-0248 or visit www.mspoultry.org.
- The Poultry Science Association (PSA) will hold its annual meeting in Niagara Falls, Ontario, Canada on July 20-23, 2008. This year marks the 100th anniversary of the PSA, and special events are planned to commemorate this occasion.
- The MPA will hold its annual meeting and convention in Destin, Fla., September 18-20, 2008.



MISSISSIPPI STATE UNIVERSITY
**Department of
 Poultry Science**

Happenings

Poultry Science Club 2008 Spring Function



The Poultry Science Club held its annual Spring Function April 10 complete with 300 pounds of boiled crawfish. Faculty, staff, students and friends of the department enjoyed the nice spring weather and fellowship.



Dr. Wallace Morgan honored with awards



Dr. Wallace Morgan, retired Poultry Science Department Head, was awarded the Lamplighter Award from the U.S. Poultry and Egg Association. This award is given to individuals who have had an important impact in the field of poultry science and the poultry industry. He was presented the award at the International Poultry Exposition in Atlanta, Ga., in January, 2008. Pictured above (left to right) are Mike Pepper, Mississippi Poultry Association president, Dr. Morgan, Mary Martha Morgan, and Dr. Michael Kidd.



A reception was held at the Hill Poultry Science Building on the MSU campus on March 28, 2008 to honor Dr. Morgan's induction into the Mississippi Poultry Hall of Fame. An endowed scholarship has been established in Dr. Morgan's honor. He is pictured above holding a plaque commemorating the establishment of the endowment. From this endowment, a scholarship will be awarded annually to help support a deserving poultry science student. Also pictured are Bob Billingsley, MPA chairman, (left) and Mike Pepper.

Department Head's Corner

By Michael Kidd, PhD
Head and Professor

Hello from Starkville. Our seniors graduating on May 2 are Nick Sallas from Columbiana, Ala., Mason Smith from Brookhaven, Ryan Weaver from Decatur, and Kathy Young, Marla Waldrop and Sarah Wallace, all from Starkville. They have accepted opportunities in the poultry industry, the allied industry, graduate school and veterinary school. We have hosted numerous schools in the department this spring and have hopes of a large enrollment class in the fall of 2008. In April we hosted 40 first and second year students from Jones County Community College. A special thanks to Tim Ishee (JCJC Agricultural Instructor) for exposing his students to Mississippi State University and poultry science.

We are excited to welcome Dr. Aaron Kiess. His research will involve food safety and welfare, among other biochemical and physiological topics. He will take over avian anatomy and physiology the next academic year, of which Dr. McDaniel has been filling in as instructor.

In the fall of 2007 an extension committee met and evaluated candidates for our vacant extension professor position. We have yet to fill our extension position but are optimistic in having it filled in the near future.

A special thanks to Bob Billingsley, Mike Pepper and Becky Beard for organizing Dr. Morgan's induction into the Poultry Hall of Fame. It was a very nice event prior to the Super Bulldog Weekend kickoff, and thanks to everyone who made the trip to Starkville. Dr. Vance Watson (Interim MSU President) addressed the group and congratulated Dr. Morgan on his accomplishments. Bob Billingsley addressed the group and read a note from Joe Sanderson, Jr. The event came to a close with a surprise presentation of the G. Wallace Morgan Endowed Scholarship for Poultry Science majors.

For more information contact:

Michael Kidd, PhD
Head and Professor
662-325-3416
mkidd@poultry.msstate.edu

Craig Coufal, PhD
Assistant Extension Professor
ccoufal@poultry.msstate.edu

www.msstate.edu/dept/poultry

Department of Poultry Science
Mississippi State University
Hill Poultry Science Building
MS 9665
Mississippi State, MS 39762